RESPONSE

In view of the following remarks, the Examiner is respectfully requested to withdraw the rejections and allow Claims 1-17 and 29-41, the only claims pending and currently under examination in this application.

Formal Matters

Claims 1-17 and 29-41 were examined and rejected.

Claim 41 has been amended to correct a typographical error.

Claims 18-28 were previously canceled.

As the above amendments introduce no new matter, their entry by the Examiner is respectfully requested.

Rejection under 35 U.S.C. §103

Claims 1-4, 6-13, 15-17, 29-33 and 35-41 have been rejected under 35 U.S.C. § 103 (a) as allegedly being rendered obvious by Beerling et al. (U.S. Patent No. 6,508,536) in view of McDevitt et al. (U.S. Patent No. 6,713,298).

With respect to rejections made under 35 U.S.C. § 103, MPEP § 2142 states:

> To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. **Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.** The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991) [emphasis added].

The present invention is drawn to printheads in which multiple printhead dies are bonded to an orifice plate having a plurality of orifices. According to the instant specification, each printhead die is bonded to the orifice plate such that at least one **resistor of the printhead die is in operational alignment with at least one orifice**

of the orifice plate to produce a functional firing chamber. The instant disclosure provides the following description:

> "Each of the orifices is aligned with at least one of the resistors on the substrate surface of a printhead die. As a result, energization of a given resistor **causes fluid expulsion from the desired orifice through the orifice plate**. (p. 11, line 30 to p. 12, line 6")

> "The orifices of the printhead may be arranged on the **exposed** surface of the orifice plate...so long as the orifices line up with the printhead dies to produce functional firing chambers....**The size of each of the orifices is sufficient to produce a spot of suitable dimensions on the substrate surface**.....(p. 8, lines 15-27).

As such, multiple printhead dies are bonded to the orifice plate by aligning the resistors with the orifices so that **fluid is expelled from the orifice** upon actuating the aligned resistors of the printhead die. In other words, the orifice plate is not just any substrate that has an opening. Instead, the orifices of the orifice plate line up with the resistors of multiple printhead dies to produce **a functional firing chamber** such that **fluid gets expelled from the orifice onto the substrate upon energization of the resistor.**

As presented in the previous response, Beerling et al. discloses a single carrier substrate having a plurality of printhead dies mounted on its surface. Each printhead die has its own orifice plate and its own plurality of orifices. As such, Beerling et al. fails to teach the element of multiple printhead dies bonded to an orifice plate as presently claimed.

According to the Office Action, the Examiner continues to equate Beerling's carrier substrate with the orifice plate of the present invention. According to the Office Action, the Examiner appears to believe that any slot or opening on the carrier substrate makes the carrier substrate an orifice plate.

However, as set forth above, multiple printhead dies are bonded to an orifice plate such that at least one **resistor of the printhead die is in operational**

alignment with at least one orifice of the orifice plate to produce a functional firing chamber.

In maintaining the rejection, the Examiner alleges that col. 4, lines 15-17 of Beerling describes an orifice plate as presently claimed (Office Action, p. 3). However, the passage cited by the Examiner is referring to the **printhead die itself,** and makes no mention of an orifice plate. Specifically, the passage states the following: "**Each printhead die** has a first surface 58 and a second surface 60, opposite the first surface 58."

However, the printhead of the present invention comprises **(1) multiple printhead dies; (2) bonded to an orifice plate** in which the orifice plate includes a plurality of orifices. As such, it is incorrect to equate Beerling's printhead die to the presently claimed **orifice plate** in which a plurality of printhead dies are bonded.

Furthermore, in response to Applicants' previously submitted arguments, the Examiner responds by stating that Beerling's carrier substrate..."has a plurality of orifices at (32), (see figure 3 and 5) (Office Action, p. 5).

According to Beerling's disclosure, the orifices (32) of Figures 3 and 5 are **fluid refill channels** on the carrier substrate (20) that are in fluid communication with a refill slot (42) of the printhead die. Figures 3 and 5 of Beerling are provided below.

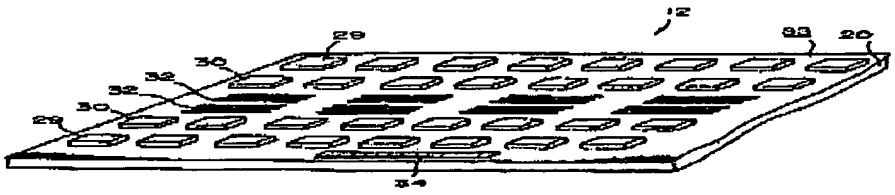

FIG. 3

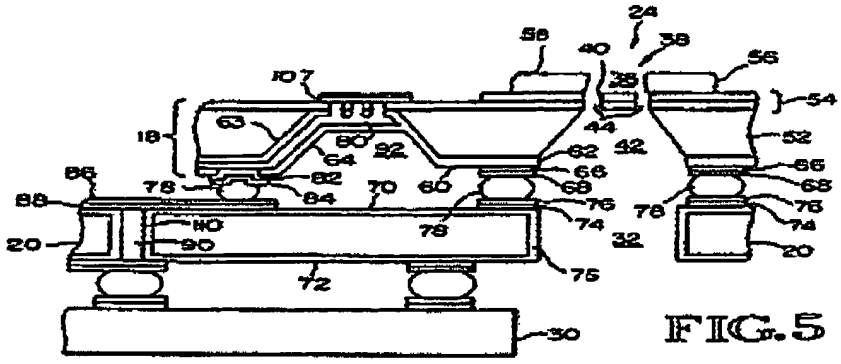

FIG. 5

However, nowhere in the disclosure does Beerling teach or suggest bonding multiple printhead dies to the carrier substrate so that at least one **resistor of the printhead die is in operational alignment with the fluid refill channel (32) to produce a functional firing chamber.**

As evident from Figure 5 above, the Examiner seems to believe that the fluid refill channel (32) of Beerling is equivalent to the orifices of the present invention because Beerling's refill channel (32) is lined up with the printhead die's resistor (40).

As discussed above, the orifices of the subject invention line up with the resistors of multiple printhead dies to produce **a functional firing chamber** such that **fluid gets expelled from the orifice upon energization of the resistor.**

Beerling specifically teaches that "upon activation of a given firing resistor (40), ink within the surrounding nozzle chamber (36) is ejected through the nozzle opening (38). As such, Beerling's refill channel does not line up with the resistor **to produce a functional firing chamber as presently claimed because** energization of the printhead die resistor does not cause fluid to be expelled from the refill channel (32).

Additionally, in response to the previously submitted arguments, the Examiner alleges that the orifice plate may be at (20) or alternatively at (20 and 58) or equated to elements (52) or (54).

In response, the Applicants point out that Beerling teaches that each printhead die comprises a silicon die (52) and a thin film structure (54). Element (58) is merely referring to a first surface of the printhead die itself. As such, each of the additional elements, which the Examiner alleges to be equivalent to the presently claimed orifice plate, is actually part of the **printhead die itself.** Therefore, it is incorrect to equate Beerling's printhead die to the presently claimed **orifice plate** in which a plurality of printhead dies are bonded.

Moreover, even if elements (52) and (54) were separate elements from the printhead die, Beerling fails to teach or suggest bonding **multiple** printhead dies to the silicon die (52) or the thin film structure (54) as in the instant claims. Nowhere does Beerling teach or suggest multiple printhead dies bonded to the silicon die (52) or thin film structure (54) such that at least one **resistor of the printhead die is in operational alignment with at least one orifice of element (52) or (54) to produce a functional firing chamber.**

As such, the Applicants submit that Beerling et al. fails to teach each and every element of the present invention.

As McDevitt et al. was cited solely for teaching that biopolymers can be applied to a substrate using Ink-jet printer heads, this reference fails to make up the fundamental deficiency in Beerling et al.

Accordingly, the combined teachings of Beerling et al. and McDevitt et al. fail to teach or suggest each and every element of the claimed invention. Therefore, the Applicants submit that a *prima facie* case of obviousness has not been established for Claims 1-4, 6-13, 15-17, 29-33 and 35-41. The Applicants respectfully request that this rejection be withdrawn.

Claims 5, 14 and 34 have been rejected under 35 U.S.C. § 103 (a) as allegedly being obvious by Beerling et al. (U.S. Patent No. 6,508,536) in view of McDevitt et al. (U.S. Patent No. 6,713,298) and further in view of Gordon et al. (U.S. Patent No. 5,855,835).

As noted above, Beerling et al. and McDevitt et al. fail to teach each and every limitation found in the claims of the present application. In particular, Beerling et al. and McDevitt et al. fail to teach the element in which **multiple printhead dies** are bonded to **an orifice plate having a plurality of orifices** such that at least one **resistor of the printhead die is in operational alignment with at least one orifice of the orifice plate to produce a functional firing chamber.**

Since Gordon was cited solely for teaching the formation of a resistor on a substrate that is made of a semiconductor, the cited reference fails to make up the deficiency of Beerling et al. and McDevitt et al. Therefore, the references alone or in combination do not teach each and every element found in the claims.

In view of the foregoing discussion, the Applicants respectfully request that the rejection of Claims 5, 14 and 34 be withdrawn.

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United States Application Serial No. 10/023,375

CONCLUSION

In view of the amendments and remarks above, the Applicants respectfully submit that all of the claims are in condition for allowance, which action is requested. If the Examiner finds that a telephone conference would expedite the prosecution of this application, please telephone John Brady at 408- 553-3584.

The Commissioner is hereby authorized to charge any fees under 37 C.F.R. §§ 1.16 and 1.17 which may be required by this paper, or to credit any overpayment, to Deposit Account No. 50-1078, order number 10010792-1.

Respectfully submitted,

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